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DEFENSE COMMUNICATIONS AGENCY

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JUSTIFICATION OF ESTIMATES
AMENDED FY 1991
PRESIDENT'S BUDGET
SUBMITTED TO CONGRESS

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JANUARY 1990

RESEARCH, DEVELOPMENT, TEST
AND EVALUATION (R,D,T&E),
DEFENSE AGENCIES
APPROPRIATION

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AMENDED FY 1991 Budget Descriptive Summaries for the
Defense Communications Agency

January 1990

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DEFENSE COMMUNICATIONS AGENCY
AMENDED FY 1991 PRESIDENT'S BUDGET

RDT&E DESCRIPTIVE SUMMARIES

JANUARY 1990

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STATEMENT "A" per George Rosenkranz
DCA Program & Budget/DCA/CPBR
TELECON 4/3/90

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DEFENSE COMMUNICATIONS AGENCY
RESEARCH, DEVELOPMENT, TEST AND EVALUATION
PROGRAM ELEMENT DESCRIPTIVE SUMMARY

INTRODUCTION AND EXPLANATION OF CHANGES

1. General. This document has been prepared to provide information on the Defense Communications Agency (DCA) Research, Development, Test and Evaluation (RDT&E) program to Congressional committees during the FY 1991 hearings. The Descriptive Summaries provide narrative information on DCA RDT&E programs and projects.

2. Comparison of FY 1989 and FY 1990 Data. A direct comparison of FY 1989 data in the Program Element Descriptive Summaries dated January 1989, will reveal only minor differences. A comparison of FY 1990 data, however, will reflect changes attributed to the transfer and restructuring of the WWMCCS ADP Modernization (WAM) Program from Air Force to DCA, a below threshold reprogramming action providing funds to support the Joint Interoperability Evaluation System (JIES), the inclusion of funds provided by Congress for Drug Interdiction efforts, and the agency's share of general Congressional reductions.

3. Relationship of Amended FY 1991 Budget Structure to the FY 1990 Budget Approved by Congress. The program element structure contained in this budget request includes no changes from the Base for Reprogramming Action (DD 1414) for RDT&E (Defense Communications Agency) which was prepared pursuant to final Congressional action on the FY 1990 DoD Budget Submission to Congress.

4. Classification. Where appropriate, classified information is identified by use of brackets as [].

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DEFENSE COMMUNICATIONS AGENCY
RESEARCH, DEVELOPMENT, TEST AND EVALUATION
SUMMARY BY BUDGET ACTIVITY

(Dollars in Thousands)

<u>Budget Activity</u>	<u>FY 1989 Estimate</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>
1. Technology Base	\$ - -	\$ - -	\$ - -
2. Advanced Tech. Development	2,551	2,408	2,486
3. Strategic Programs	89,725	143,018	92,395
4. Tactical Programs	66,553	62,669	55,245
5. Intell. and Communications	23,614	24,531	23,942
6. Defensewide Mission Support	<u>- -</u>	<u>- -</u>	<u>- -</u>
Total Direct RDT&E Program	\$182,443	\$232,626	\$174,068
Reimbursable Programs	<u>27,443</u>	<u>57,000</u>	<u>51,000</u>
TOTAL RDT&E PROGRAM	\$209,886	\$289,626	\$225,068

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DEFENSE COMMUNICATIONS AGENCY
RESEARCH, DEVELOPMENT, TEST AND EVALUATION
SUMMARY BY PROGRAM CATEGORY

(Dollars in Thousands)

	<u>FY 1989</u> <u>Estimate</u>	<u>FY 1990</u> <u>Estimate</u>	<u>FY 1991</u> <u>Estimate</u>
<u>Research and Development (Program 6)</u>			
6.1 Research	\$ - -	\$ - -	\$ - -
6.2 Exploratory Development	- -	- -	- -
6.3 Advanced Development	56,267	57,995	0
6.4 Engineering Development	- -	- -	- -
6.5 Management & Support	- -	- -	- -
Subtotal, Research and Development (Program 6)	<u>\$ 56,267</u>	<u>\$ 57,995</u>	<u>\$ 0</u>
<u>Operational Systems Program</u>			
Subtotal, Operational Systems Program	<u>\$126,176</u>	<u>\$174,631</u>	<u>\$174,068</u>
Total Direct RDT&E Program	\$182,443	\$232,626	\$174,068
Reimbursable Programs	<u>27,443</u>	<u>57,000</u>	<u>51,000</u>
TOTAL RDT&E PROGRAM	\$209,886	\$289,626	\$225,068

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DEFENSE COMMUNICATIONS AGENCY
RESEARCH, DEVELOPMENT, TEST AND EVALUATION
DETAILS BY BUDGET ACTIVITY

(Dollars in Thousands)

	<u>FY 1989</u> <u>Estimate</u>	<u>FY 1990</u> <u>Estimate</u>	<u>FY 1991</u> <u>Estimate</u>
<u>Budget Activity 2. Advanced Technology Development</u>			
<u>Operational Systems Program</u>			
0305108K C2 Research	\$ 2,551	\$ 2,408	\$ 2,486
Total Budget Activity 2	\$ 2,551	\$ 2,408	\$ 2,486
<u>Budget Activity 3. Strategic Programs</u>			
<u>Program 6.3</u>			
0603734K Island Sun	\$ 56,267	\$ 57,995	\$ 0
<u>Operational Systems Program</u>			
0302016K NMCS-Wide Support	\$ 6,515	\$ 12,885	\$ 12,088
0302019K WWMCCS Sys Engr	17,226	16,674	16,952
0303131K MEECN	9,717	7,990	8,240
0303154K WAM	0	47,474	55,115
Subtotal, Operational Systems Program	\$ 33,458	\$ 85,023	\$ 92,395
Total, Budget Activity 3	\$ 89,725	\$ 143,018	92,395
<u>Budget Activity 4. Tactical Programs</u>			
<u>Operational Systems Program</u>			
0201135K CINC Initiatives	\$ 1,877	\$ 1,913	\$ 1,974
0208045K C3 Interoperability (JTC3A)	58,699	54,297	46,682
0208298K Management Headquarters (JTC3A)	5,977	6,459	6,589
Total Budget Activity 4	\$ 66,553	\$ 62,669	\$ 55,245
<u>Budget Activity 5. Intelligence and Communications</u>			
<u>Operational Systems Program</u>			
0303126K Long-Haul Commun	\$ 19,161	\$ 20,768	\$ 20,516
0303127K Support of the NCS	4,453	3,763	3,426
Total Budget Activity 5	\$ 23,614	\$ 24,531	\$ 23,942
TOTAL DIRECT RDT&E PROGRAM	\$182,443	\$232,626	\$174,068

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0305108K

Title: Command and Control Research

Budget Activity: 02

A. (U) RESOURCES (Dollars in \$000)

Number & Title	FY 1989 Actual C2 Research	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
6320	2,551	2,408	2,486	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element represents DCA's portion of a joint DCA/multi-Service effort that supports research into emerging technologies, methodologies and theories of military command and control (C2), the application of research results to resolve the problems of C2 associated with joint operations and to foster optimal use of MILDEP laboratory resources. The Deputy Under Secretary of Defense (C3I) approved the initiation of the C2 research program as an intellectual discipline to counter the imbalance of Soviet research into the theoretical foundations of military C2.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1991:

(U) Project Number and Title: 6320 (Command and Control Research):

This project supports the Joint Directors of Laboratories (JDL) Technical Panel for C3 (TPC3) concerning basic research that has multi-Service impact. The project develops and tests insertion methods which promote technological currency in fielded and developmental C3 systems; investigates, disseminates, consolidates and codifies the theory and practice of C3, particularly with regard to effective Joint and Combined C3 processes; and identifies and assesses technological advances in order to promote those with promising C3 application.

(U) FY 1989 Accomplishments:

- o Continued support of wargames enhancement
- o Further developed use of Headquarters Effective Analysis Tool
- o Sponsored annual C2 Research Symposium
- o Promoted industrial outreach and commercial-off-the-shelf technology insertion by providing access to JDLNET (a prototype distributed C3 network) for developmental hardware and software against a loaded military C3 network
- o Established JDLNET as subset of Defense Data Network (DDN) Integrated Secure Network (DISNET) with gateway capability into other simulation subnets and operational networks
- o Managed spread spectrum capabilities
- o Demonstrated internet monitoring and control
- o Developed advanced multi-netting algorithms

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0305108K

Title: Command and Control Research

Budget Activity: .02

(U) FY 1990 Planned Program:

- o Continue as above
- o Include C2 issues in space and in low-intensity conflict
- o Conduct research and sponsor projects based on reports of observers of C2 play in wargames

(U) FY 1991 Planned Program:

- o Continued development of command & control initiatives.

(U) Program to Completion: This is a continuing program

Work Performed By: Analytic Science Corp, Arlington, VA; Massachusetts Institute of Technology, Cambridge, MA; Booz-Allen Associates, Arlington, VA; Harvard University, Cambridge, MA; and Alphatech, Inc., Burlington, MA

(U) Related Activities: None

(U) Other Appropriations Funds: None

(U) International Cooperative Agreements: Not applicable.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARYProgram Element: #0302016KTitle: NMCS-Wide SupportBudget Activity: 03A. (U) RESOURCES (Dollars in \$000)

Project Number & Title	FY 1989 Actual	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
S30 NMCS Subsystem Eng	2,094	2,802	2,875	Continuing	Continuing
S32 NMCS Command Center Eng	2,306	5,652	4,695	Continuing	Continuing
J60 Tech Support to USD(A), ASD(ISP) & ASD (PA&E)	0	619	658	Continuing	Continuing
W90 White House Situation Spt Staff	0	474	462	Continuing	Continuing
S45 Sec Video Tele Sys	1,001	2,838	2,898	Continuing	Continuing
S70 Project CCP	0	500	500	Continuing	Continuing
C99 Special ASD(C3I) Projects	1,114	0	0	Completed	Completed
Total	6,515	12,885	12,088		

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element provides concept development, requirements definition, proof-of-principle, and system/integration engineering for the National Military Command System (NMCS). The NMCS is the keystone component of the Worldwide Military Command and Control System (WWMCCS) and consists of the National Military Command Center (NMCC), the Alternate NMCC (ANMCC), the National Emergency Airborne Command Post (NEACP), other special command centers and communications connectivity between the national-level command center component and the U&S Command Components. The NMCS is designed to meet the command and control requirements of the National Command Authorities (NCA) and the Joint Staff for all crises and threat scenarios involving the military forces of the US.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) Project Number and Title: S30 (NMCS Subsystem Engineering) - This project provides for concept development, requirements analysis, feasibility reports, system/subsystem design, and implementation/acquisition specifications for NMCS Command Centers in the areas of NMCS-unique information (processing) systems and of the NMCS interfaces(s) with other warning/strategic/national information systems.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302016K

Title: NMCS-Wide Support

Budget Activity: 03

(U) Project S30 Continued:

(U) FY 1989 Accomplishments:

- o Transferred the Nuclear Planning and Execution System (NPES) communications interface Initial Operational Capability (IOC) capabilities of the NMCS to other NPES nodes at the nuclear CINCS.
- o Initiated the analysis to expand the NPES network communications requirements.

(U) FY 1990 Planned Program:

- o Make technical assessments for integration of the Survivable Communications Interface System (SCIS) into the NMCS.
- o Implement WASHFAX IV proof-of-concept system.
- o Continue SETA support replacement for the Improved Emergency Message Automated Transition System (IEMATS) and the Interim IEMATS Replacement (IIR) system.
- o Intensify T&E support efforts for the IIR and several warning systems.
- o Initiate development of standard information systems for the survivable platforms.

(U) FY 1991 Planned Program:

- o Complete IIR user acceptance testing.
- o Conduct preliminary design reviews for the Automated Emergency Action Message Processing Dissemination System (AEPDS).
- o Implement and integrate several new/enhanced warning systems in the NMCS command centers.

(U) Program to Completion: This is a continuing program.

(U) Work Performed By: MITRE, McLean, VA; Electrospace Systems Inc., Arlington, VA; Booz-Allen & Hamilton Inc., Arlington, VA; DCA Center for Command and Control and Communications System.

(U) Related Activities: Related program elements supporting the NMCS technical support are assigned to the military departments. There is no duplication of effort within the Agency.

(U) Other Appropriation Funds:

Operations and Maintenance: \$188K (FY 1989).

(U) International Cooperative Agreements: Not Applicable.

(U) Project Number and Title: S32 (NMCS Command Center Engineering) - This project provides concept development, requirements analysis, feasibility investigations, system/subsystem design and analysis, and implementation/acquisition specifications for NMCS command centers in the areas of communications-electronics and environmental facilities.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302016K

Title: NMCS-Wide Support

Budget Activity: 03

(U) Project S32 Continued:

(U) FY 1989 Accomplishments:

- o Completed the National Military Command Center (NMCC) High Altitude Electro-magnetic Pulse (HEMP) near term work and the Alternate National Military Command Center (ANMCC) communications survivability analysis and improvement.
- o Provided technical assistance for the National Emergency Airborne Command Post (NEACP), Worldwide Airborne Command Post (WWABNCP) and Special Air Mission (SAM) aircraft.

(U) FY 1990 Planned Program:

- o Develop integrated command center capabilities.
- o Test and evaluate proposed communications enhancements.
- o Provide functional baseline and system transition engineering.
- o Provide new and improved C2 technological developments needed for a single system concept.
- o Enhance NEACP Engineering Plan
- o Prepare NEACP High Powered Transmit Set (HPTS) Qualitative Operational Test and Evaluation (QOT&E) Test Plan.
- o Prepare NEACP Communications Enhancement Test Plan.

(U) FY 1991 Planned Program

- o Develop improvements to the NMCS.
- o Develop documentation detailing command center engineering requirements to achieve integration of NMCS improvement projects.

(U) Program to Completion: This is a continuing program.

(U) Work Performed By: MITRE, McLean, VA; Electrospace Systems Inc., Arlington, VA; Booz-Allen & Hamilton Inc., Bethesda, MD; DCA Center for Command and Control and Communications System.

(U) Related Activities: This project relates to other command center support in Program Element #0302019K (WWMCCS System Engineering) such as Command Center Commonality and Integration Engineering project; and Program Element #0303131K (MEECN) such as the Strategic Connectivity Engineering project. There is no duplication of effort within the Agency or DOD.

(U) Other Appropriation Funds:

Operations and Maintenance: \$1,458K (FY 1989); \$855K (FY 1990); \$760K (FY 1991).

(U) International Cooperative Agreements: Not Applicable.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302016K
Title: NMCS-Wide Support

Budget Activity: 03

(U) Project Number and Title: J60 (Technical Support to USD(A), ASD(ISP), ASD(PA&E)) - This project is required to research and develop tools, techniques and models to support analyses tasked from the Under Secretary of Defense for Acquisition (USD(A)) relative to the Air Defense Initiative; from the Assistant Secretary of Defense for International Security Policy (ASD(ISP)) for the development of techniques to model Electromagnetic Pulse (EMP) at high altitudes and techniques to better support their analysis of strategic targeting policy and options; and from the Assistant Secretary of Defense for Program Analysis and Evaluation (ASD(PA&E)) for the development of techniques and models to support areas such as damage expectancy analysis of non-nuclear weapons effectiveness against strategic targets. This project also supports the same customers in areas such as nuclear winter, fallout, weather phenomena and fire modeling.

(U) FY 1989 Accomplishments:

- o Prior to FY 1990, technical support to USD(A), ASD(ISP) and ASD(PA&E) RDT&E programs were funded in the DCA O&M appropriation. Beginning in FY 1990, funds associated with these efforts have been realigned to the RDT&E appropriation in accordance with DoD funding guidance.

(U) FY 1990 Planned Program:

- o Respond to the current requirements of USD(A), ASD(ISP), and ASD(PA&E) as modified by the then current world situation.
- o Expand current surface-to-air defense models to reflect possible future candidate architectures.
- o Expand the modeling of joint service battle management for air defense and space defense.
- o Enhance the accuracy and validity of the modeling of non-nuclear weapons effects in strategic policy evaluation.
- o Research problems associated with long range air defense detection and engagement systems.

(U) FY 1991 Planned Program:

- o Respond to the then current requirements of USD(A), ASD(ISP), and ASD(PA&E) as modified by the then current world situation.
- o Develop models to reflect the prior year research in long range air defense detection and engagement systems and battle management.
- o Research and develop new models for the development and evaluation of national strategic targeting policy representing the then current world situation.

(U) Program to Completion: This is a continuing program.

(U) Work performed by: DCA/Joint Data Systems Support Center (JDSSC); UNISYS Corporation, McLean, Va; General Sciences Corporation, Laurel, Md; SAIC, McLean Va; other government agencies; and various not yet identified scientifically qualified small business contractors.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302016K

Title: NMCS-Wide Support

Budget Activity: 03

- (U) Project Number J60 Continued:
- (U) Related activities: These efforts provide modeling in direct support of PE #0605104D (Technical Support to USD(A) and the Joint Staff) and of PE #0603741D (Air Defense Initiative). There is no duplication of effort either within the Agency or within DoD.
- (U) Other Appropriations Funds: None.
- (U) International Cooperative Agreements: Not Applicable.

(U) Project Number and Title: W90 (White House Situation Support Staff) - This project ensures that full level capabilities are provided to the President, Vice President, the National Security Advisor and his staff. This effort emphasizes information exchange and display and procedures. This project will be transferred from PE #0303126K in FY 1990 to this program element to consolidate National Security Information and Situation Management System (NSI&SMS) efforts within a single program element.

- (U) FY 1989 Accomplishments:
 - o Evaluated and researched the latest technology enhancements to provide national crisis decision making and crisis management situations to the President, the Vice President, the National Security Council (NSC), and the White House Staff decision makers.
- (U) FY 1990 Planned Program:
 - o Evolve and modernize classified systems supporting National Level Decision Making and Crisis Management support to the President, Vice President, and the National Security Council.
 - o Plan and improve systems support for the NSI&SMS program.
- (U) FY 1991 Planned Program:
 - o Improve the interoperability and survivability, and performance of the NSI&SMS.
- (U) Program to Completion: This is a continuing program.
- (U) Work Performed By: Contractor (TBD); DCA, White House Situation Support Staff.
- (U) Related Activities: The White House Situation Support Staff Project directly supports the improvement of White House Communications. There is no duplication of effort.
- (U) Other Appropriation Funds: None
- (U) International Cooperative Agreements: Not Applicable.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302016K

Title: NMCS-Wide Support

Budget Activity: 03

(U) Project Number and Title: S45 (Secure Video Teleconferencing System/National Security Information and Situation Management System) - This project provides funding to implement and install a secure multi-media teleconferencing network of crypto equipment and switches for a highly classified project for the Executive Branch of the government.

(U) FY 1989 Accomplishments:

- o Tested and accepted the final node in the system.
- o Completed development of, and accepted, the IOC-E software.
- o Commenced development of user-identified software enhancements.

(U) FY 1990 Planned Program:

- o Test and accept user-defined software enhancements.
- o Evaluate and start design of system reliability enhancements.
- o Assess requirements for mobile capability.
- o Transition to focus on the broader scope of National Security Information and Situation Management System (NSI&SMS).

(U) FY 1991 Planned Program:

- o Complete design of, test, and accept system reliability enhancements.
- o Define requirements for multi-level secure gateways.
- o Commence development of mobile capability.
- o Assess requirements for alternative transmission paths.

(U) Program to Completion: This is a continuing program.

(U) Work Performed By: Harris Corporation, Melbourne, FL; MITRE, McLean, VA; Systems Eng. and Mgmt. Assoc. (SEMA), Inc., Falls Church, VA.

(U) Related Activities: There is no duplication of effort within the Agency.

(U) Other Appropriation Funds:

Operations and Maintenance: \$1,566 (FY 1989); \$338 (FY 1990); \$329 (FY 1991).

(U) International Cooperative Agreements: Not Applicable.

(U) Project Number and Title: S70 (Project CCP) - All aspects of this project are classified and require special access. Therefore, information on this project is not contained in this document but can be obtained upon request.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K
 Title: WWMCCS System Engineer

Budget Activity: 03

A. (U) RESOURCES (Dollars in \$000)

<u>Project Number & Title</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
S03 Cmd Cntr Commonality Engr & Integration	2,515	2,517	2,438	Continuing	Continuing
S07 MILSATCOM System PIng	2,244	2,251	2,650	Continuing	Continuing
S10 Def-Wide C3 Arch & PIng	4,990	5,272	5,640	Continuing	Continuing
S13 Theater C3 Arch & PIng	3,285	1,253	675	Continuing	Continuing
S24 Strat C3 Arch & PIng	3,922	3,851	4,036	Continuing	Continuing
AI9 Project OAT (Office of Advanced Technology)	270	589	591	Continuing	Continuing
S39 Thrift Account	0	941	922	Continuing	Continuing
Total	17,226	16,674	16,952		

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element provides overall system analysis, architectural development, systems engineering and integration, and developmental engineering responsibilities for joint and national level command, control, and communications (C3) systems.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN 1991:

(U) Project Number and Title: S03 (Command Center Commonality Engineering and Integration) - This project provides direct and real-time technical services and engineering expertise to the command centers for the Unified and Specified Commands, and implements the Joint Staff (JS) directed Command Center Improvement Program (CCIP) to focus technology improvements to the U&S command centers.

(U) FY 1989 Accomplishments:

- o Developed MultiLevel Security at the DoD Prototype so that the technology can be exported to the command center community.
- o Performed a Technical Analysis/Cost Estimate on the Multi-Command Required Operational Capability (MROC) for all command centers.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K

Title: WWMCCS System Engineer

Budget Activity: 03

(U) Project Number S03 Continued:

- o Developed a target architecture for command center information systems.
- o Developed individual software module standards for command center information systems starting with a digital mapping module.

(U) FY 1990 Planned Program:

- o Develop a generic information system architecture and functional design, identifying capabilities of architecture modules and produce specifications for those modules.
- o Develop a defined modular architecture incorporating advances in Trusted Operating Systems, MLS Networks, Secure Data Network Standards, LAN encryption and Trusted databases.
- o Develop a prototype/demonstration capability based on artificial intelligence.

(U) FY 1991 Planned Program:

- o Test and demonstrate the defined modular architecture.
- o Test the prototype demonstration capability based on artificial intelligence for functionality at selected command centers.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: MITRE Corporation, McLean, VA; Booz-Allen & Hamilton, Inc., Bethesda, MD; U.S. Army Corps of Engineers, Construction Engineering Research Lab (CERL), Champaign, IL; DCA Center for Command, Control and Communications Systems.

(U) Related Activities: This project relates to other command center projects in Program Element #0302016K (NMCS-Wide Support). There is no duplication of effort within the Agency.

(U) Other Appropriation Funds: Operations and Maintenance: \$131K (FY 1989); \$32K (FY 1990); \$252K (FY 1991).

(U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: S07 (Military Satellite Communications Systems Planning) - This project provides an overall DoD satellite communications systems architecture. The objective is to establish a single, coordinated approach to the planning, development, acquisition, and operational deployment of secure, reliable, enduring and cost-effective DoD satellite communications.

(U) FY 1989 Accomplishments:

- o Reviewed and assessed the capabilities of the 1987/1988 recommended MILSATCOM architecture.
- o Evaluated candidate MILSATCOM architectures to accommodate long-range user requirements beyond the year 2000 and developed a plan for transition from present to objective system.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K
Title: WWMCCS System Engineer

Budget Activity: 03

(U) Project S07 Continued:

(U) FY 1990 Planned Program:

- o Develop and promulgate a DoD satellite communications systems architecture.
- o Investigate evolving physical and RF threats to MILSATCOM in addition to publishing the overall architecture/sub-architecture documents that cover UHF, SHF, and EHF systems.
- o Identify and analyze advanced technology options suitable for MILSATCOM system applications.

(U) FY 1991 Planned Program:

- o Review the adequacy of the MILSATCOM System Architecture in terms of threat, affordability, requirements satisfaction, and technology applications.
- o Evaluate and analyze the first MILSTAR satellite placed in orbit and pre-launch critical design review for the UHF follow-on satellite system.
- o Accomplish intersatellite network coordination with other nations systems as required.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: MITRE Corporation, McLean, VA; AEROSPACE Corporation, El Segundo, CA; M/A-COM Government System, Inc., Vienna, VA; Lincoln Labs, Lexington, MA; DCA Center for Command and Control and Communications Systems.

(U) Related Activities: This project relates to other ongoing satellite communications programs such as Program Element #0303126K (Long Haul Communications) and 0303127K (Support of the National Communications System (NCS)). There is no duplication of effort within the Agency.

(U) Other Appropriation Funds: Not applicable.

(U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: S10 (Defense-Wide C3 Architecture & Planning) - This project provides for the development of communications architectures that integrate Service, theater, strategic, Allied, and NATO communications programs; provides specialized support to NATO in the development of rationalized U.S., NATO, and Allied communications systems; develops other mission-oriented analyses (MOA) architectural strategies, plans, and programs as tasked; assists the C3 analysis and evaluation community in focusing their resources on key issues, improving the rigor of their analysis, and assessing the effectiveness of wartime headquarters; assesses the entire C2 program of DoD for affordability and utility and conducts other C3 planning tasks for JCS. Prior to FY 1991 the project also provides guidance for the development of Defense Communications System (DCS) programs and develops communications architectures for the DCS. In FY 1991, these DCS efforts will be transferred to PE 0303126K to consolidate all defense communications systems activities within a single program element.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K

Title: WWMCCS System Engineer

Budget Activity: 03

(U) Project Number S10 Continued:

(U) FY 1989 Accomplishments:

- o Analyzed alternatives for integrated DCS/tactical architectures for 2005. Developed Defense Message System (DMS) alternatives. Developed survivability enhancements for DCS Europe. Commenced survivability assessment of DCA-Korea. Enhanced the Secure Voice Architecture to reflect tactical interfaces.
- o Developed a C3 planning effort to support the JCS Wide-Area Surveillance and Target Tracking (WAST2) concept.

(U) FY 1990 Planned Program:

- o Continue exploration of DMS options.
- o Develop options for DCS drawdown in Europe.
- o Develop survivability solutions for Korean DCS.
- o Develop transition plans for 2005 DCS and World-Wide Digital System Architecture (WWD SA).
- o Assess security options for data internets.
- o Develop a WAST2 C3 architecture.

(U) FY 1991 Planned Program:

- o Address residual issues in DCA and WWD SA transition.
- o Develop options in Network Control.
- o Develop an overall security architecture.
- o Develop a WAST2 C3 Master Plan.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: MITRE Corporation, McLean, VA; Booz-Allen & Hamilton, Inc., Bethesda, MD; System Planning Corporations, Arlington, VA; Institute for Defense Analysis (IDA), Alexandria, VA; BDM, Inc., McLean, VA; DCA Center for Command and Control and Communications Systems.

(U) Related Activities: This project relates to other C3 projects in Program Element #0302019K (WWMCCS System Engineer). There is no duplication of effort within the Agency.

(U) Other Appropriation Funds:

Operations and Maintenance: \$729 (FY 1989); \$879(FY 1990); \$793 (FY1991)

(U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: S13 (Theater C3 Architecture and Planning)- This project provides technical support in the areas of C3 planning, system engineering, and system integration to the Unified Theater CINCs i.e., USEUCOM, USPACOM, USCENTCOM, USLANTCOM, USSOUTHCOM, USSOCOM. This support usually takes the form of assisting the CINCs in the areas of C3 architectures and Master Plans, as well as conducting analyses of special purpose systems e.g., for non-strategic nuclear forces. Support is also provided to NATO to insure that planned C3 improvements take into account U.S. capabilities and requirements.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K
Title: WWMCCS System Engineer

Budget Activity: 03

(U) Project Number S13 Continued:

(U) FY 1989 Accomplishments:

- o Refined a consolidated US/NATO/Allied C3 architecture to ensure interoperability in accordance with C3I policy.
- o Integrated USEUCOM and USPACOM architectures with other theater architectures.
- o Refined the worldwide Non-Strategic Nuclear Forces (NSNF) C3 architecture.
- o Continued to provide U.S. Defense Communications Field Office (USDCFO) technical assistance at SHAPE and NACISA; and expand support to USCENTCOM and USSOUTHCOM.

(U) FY 1990 Planned Program:

- o Develop a baseline TNF C3 survivability assessment supporting NATO.
- o Develop assessment of HF capabilities to support special mission in USCENTCOM.
- o Develop USPACOM Theater HF study and test plan to resolve uncertainties associated with advance HF, extending concepts to other theaters.
- o Examine Computer Modeling Tools for Performance/Survivability supporting Non-Strategic Nuclear Forces (NSNF).

(U) FY 1991 Planned Program:

- o Complete development of final NATO C3 Architecture based on national comments received.
- o Begin initial USPACOM HF testing, and develop a Type A specification

(U) Program to completion: This is a continuing program.

(U) Work Performed By: MITRE Corporation, McLean, VA; Institute for Defense Analysis (IDA), Alexandria, VA; Titan, Inc., Vienna, VA; DCA Center for Command and Control and Communications Systems.

(U) Related Activities: This project relates to other architecture projects in Program Element #0302019K (WWMCCS System Engineer). There is no duplication of effort within the Agency.

(U) Other Appropriation Funds:

Operations and Maintenance: \$3,217 (FY 1989); \$2,815 (FY 1990); \$3,284 (FY 1991)

(U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: S24 (Strategic C3 Architecture & Planning)
- This project identifies, evaluates, and develops alternative strategic C3 architectures for strategic offensive and defensive force employment and strategic C3 concepts that accomplish national policy objectives for strategic and nuclear warfare.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K
Title: WWMCCS System Engineer

Budget Activity: 03

- (U) Project Number S24 Continued:
 - (U) FY 1989 Accomplishments:
 - o Initiated C3 requirements of trans-attack reconnaissance for ASD/C3I.
 - o Assessed the impact of the SDI and its integration into the WWMCCS.
 - (U) FY 1990 Planned Program:
 - o Continue developing C3 architectures for NSNF for relocatable targets.
 - o Develop the first C3 architecture for Wide Area Surveillance Targeting and Tracking.
 - o Develop architectures for evolving technologies such as Terrestrial Landline and Adaptive HF.
 - (U) FY 1991 Planned Program:
 - o Plan for integrating NMCS and SDI architectures.
 - o Refine the T&E Master Plan and coordinate and conduct communications tests.
 - (U) Program to completion: This is a continuing program.
- (U) Work Performed By: MITRE Corporation, McLean, VA; Institute for Defense Analysis (IDA), Alexandria, VA; Titan, Inc., Vienna, VA; ESI, Richardson, TX; Science Applications International, Corp., McLean, VA; DCA Center for Command and Control and Communications Systems.
- (U) Related Activities: This project relates to other C3 improvement projects in Program Element #0303131K (MEECN). There is no duplication of effort within the Agency.
- (U) Other Appropriation Funds: Operations and Maintenance: \$100K (FY 1989); \$138 (FY 1990); \$143 (FY 1991)
- (U) International Cooperative Agreements: Not applicable.
- (U) Project Number and Title: A19 (Project OAT - Office of Advanced Technology) - This project monitors, assesses and reports on research and technology that has the potential to profoundly influence the design and implementation of DoD C3 systems.
 - (U) FY 1989 Accomplishments:
 - o Conducted workshops on technical areas for development of high level C3 and Information Systems.
 - o Develop R&D Memorandums of Understanding for leverage in development of specific technologies most beneficial to military/NCS C3.
 - (U) FY 1990 Planned Program:
 - o Perform studies and analyses in response to ASD(C3I), Joint Staff, or Office of Secretary of Defense taskings related to C2 or C3 technology assessment, evaluation or experimentation.
 - o Identify and introduce advanced technology candidates into the operational elements of DCS.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0302019K

Title: WWMCCS System Engineer

Budget Activity: 03

(U) Project Number A19 Continued:

- o Sponsor a Technology Development Center in Command, Control, Communications and Intelligence (C3I) at George Mason University (GMU) to conduct broad spectrum C3I R&D. This effort is being jointly funded by industry, by the Virginia Center for Innovative Technology and by the Federal Government.

(U) FY 1991 Planned Program:

- o Acquire and testbed recommended technologies for subsequent insertion into ongoing DCA projects.
- o Develop a C3I curriculum at the GMU Technology Development Center to offer a Master Science degree in C3I.
- o Continue to perform C2 and C3 technology assessments, evaluations or experimentations in response to ASD(C3I), Joint Staff, or OSD taskings.

(U) Program to completion: This is a continuing program.

- (U) Work Performed By: Naval Ocean Systems Center, San Diego, California; MITRE Corporation, McLean, VA; George Mason University, Fairfax, VA; DCA Associate Director for Engineering and Technology

- (U) Related Activities: Not applicable.

- (U) Other Appropriation Funds:

Operations and Maintenance: \$200K (FY 1989); \$200K (FY 1990); \$200K (FY 1991)

- (U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: S39 (Thrift Account) - All aspects of this project are classified and require special access. Therefore, information on this project is not contained in this document but can be obtained upon request. Fiscal Year 1989 efforts were funded by reimbursable funds.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARYProgram Element: 0303131KTitle: Min Essential Emergency Comm NetworkBudget Activity: 03A. (U) RESOURCES (Dollars in \$000)

<u>Project Number & Title</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
S25 Strat Conn Test & Eval	3,817	2,211	2,387	Continuing	Continuing
S26 Strat Conn Engineering	5,900	5,779	5,853	Continuing	Continuing
Total	9,717	7,990	8,240		

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element provides system engineering, development, and technical support for the Strategic Connectivity (SC) network and the Minimum Essential Emergency Communications Network (MEECN). The SC network ensures survivable, endurable two-way communications among critical National Military Command System (NMCS) and CINC elements. The MEECN, a diverse conglomerate of communications assets owned and operated by the Services, focuses on providing highly reliable one-way communications between the NMCS and the globally deployed strategic forces for Emergency Action Message (EAM) dissemination.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991

(U) Project Number and Title: S25 (Strategic Connectivity Test & Evaluation) - This project is required to investigate, measure and assess current survivable communications capabilities of the Worldwide Military Command and Control System Airborne Resources and to investigate and identify systems deficiencies requiring long-term development. Primary emphasis of the program is to integrate new systems and procedures into the strategic connectivity system in order to increase system performance and capability.

(U) FY 1989 Accomplishments:

- o Conducted three major POLO HAT exercises and three Strategic Connectivity Performance Tests.
- o o Continued measurement of current system performance by conducting military exercises to focus on technical testing of new systems such as Nuclear Planning and Execution System (NPES) and Miniature Receive Terminal (MRT).

(U) FY 1990 Planned Program:

- o Measure current system performance and evaluate the integration of new or existing communications systems into the strategic connectivity system., (i.e., the integration of MILSTAR and GWEN).

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0303131K

Title: Min Essential Emergency Comm Network

Budget Activity: 03

- (U) Project Number S25 Continued:
 - o T&E program will focus on initial testing of new fielded systems such as Nuclear Planning and Execution System and Miniature Receive Terminal.
- (U) FY 1991 Planned Program:
 - o Test the timely flow of information between sensor sites, survivable command centers, and force elements in a simulated nuclear stressed environment.
 - o Conduct testing in context of entire strategic C3 system and procedure under a variety of quasi-realistic scenarios.
- (U) Program to Completion: This is a continuing program.
- (U) Work Performed By: MITRE, Corporation, McLean, VA; Electrospace Systems Inc., Arlington, VA; DCA Center for Command and Control and Communications System.
- (U) Related Activities: This project relates to other C3 improvement projects in Program Element #0302019K (WWMCCS System Engineering) such as Strategic C3 Architecture and Planning project. There is no duplication of effort within the Agency or DOD.
- (U) Other Appropriation Funds:
Operations and Maintenance: \$1,095K (FY 1990); \$1,148K (FY 1991).
- (U) International Cooperative Agreements: Not Applicable.
- (U) Project Number and Title: S26 (Strategic Connectivity Engineering)
- This project provides for the development of new procedures and analysis of performance capabilities for the Strategic Connectivity network; develops joint management concepts and procedures for the World Wide Airborne Command Post (WWABNCP) Systems; and improves strategic force management capabilities. In addition, it provides the necessary tools to analyze and evaluate the technical capabilities of the MEECN and MEECN Support Systems regarding connectivity, survivability, and deficiencies to recommend R&D initiatives for further improvements to the MEECN.
- (U) FY 1989 Accomplishments:
 - o Completed Very Low Frequency/Low Frequency section of the Strategic Connectivity System Engineering Plan (SCSEP).
 - o Continued Ultra High Frequency and SATCOM section of the SCSEP.
 - o Initiated High Frequency section of the SCSEP.
- (U) FY 1990 Planned Program:
 - o Continue to expand and reassess the Strategic Connectivity Master Plan (SCMP) and the SCSEP.
 - o Incorporate Strategic Defense Initiative (SDI) and Air Defense Initiative (ADI) C3 Concepts into the SCMP.
 - o Complete initial version of SCMP and SCSEP sections related to MILSTAR and alternative systems, Tactical Warning/Attack Assessment (TW/AA) and conferencing in the SCSEP efforts.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: #0303131K

Title: Min Essential Emergency Comm Network

Budget Activity: 03

- (U) Project Number S26 Continued:
 - (U) FY 1991 Planned Program:
 - o Develop coordinated strategic communications plans.
 - o Provide systems engineering assessments in support of the ASD/C3I.
 - o Incorporate force reportback systems into the Strategic Connectivity Systems Engineering Plan.
 - o Develop the Nuclear C3 Master Plan.
 - o Continue support of Project ALPHA.
 - (U) Program to Completion: This is a continuing program.
- (U) Work Performed By: MITRE Corporation, McLean, VA; Naval Oceans System Center, San Diego, CA; Sciences Application International Corp., (SAIC), McLean, VA., Naval Space and Warfare Systems Command (SPAWAR), Wash., D.C.; DCA Center for Command and Control and Communications System.
- (U) Related Activities: This project relates to other NMCS enhancement support projects in Program Element #0302016K (NMCS Wide Support) and C3 improvement efforts in Program Element #0302019K (WWMCCS System Engineering). There is no duplication of effort within the Agency or DOD.
- (U) Other Appropriation Funds: Not applicable.
- (U) International Cooperative Agreements: Not Applicable.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARYProgram Element: 0303154KPE Title: WWMCCS ADP Modernization (WAM) ProgramBudget Activity : 03A. (U) RESOURCES (Dollars in \$000):

<u>Project Number Title</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
J06 WWMCCS ADP Modernization (WAM) Program	0	46,797	54,427	Continuing	Continuing
T50 Operational Test Agency (OTA) Assessment	0	677	688	Continuing	Continuing
Total	0	47,474	55,115		

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element provides for design, development, evolution and modernization of the Worldwide Military Command and Control System (WWMCCS) hardware and and software systems that support conventional force command and control activities of the National Command Authority (NCA), The Joint Staff, and the Unified and Specified commands. Prior to FY 1992, this program element will also provide for the establishment and maintenance of a major field independent operational test capability for the WWMCCS ADP Modernization program.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) Project Number and Title: T06 (Operational Test Agency (OTA) Assessment) - This project provides for independent WAM program test assessment and evaluation. Work will include developing Part IV of the WAM Test and Evaluation Master Plan (TEMP), developing the independent evaluation plan (IEP), developing the test design plan (TDP), monitoring development tests for applicability to OT&E, and producing the independent evaluation report (IER).

(U) FY 1989 Accomplishments:

- o The OTA mission was added to the DCA charter during FY 1989 after submission of the FY 1990/FY 1991 budget. In FY 1990 and FY 1991, WAM OTA costs were funded through the WAM program. Thereafter, the Agency direct funded the new mission.
- o Established an independent dedicated WAM OTA test team at the JITC.
- o Initiated and completed Part IV of the WAM TEMP.
- o Planned for Test & Evaluation Working Group (TEWG).

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303154K

PE Title: WWMCCS ADP Modernization (WAM) Program

Budget Activity: 03

- (U) Project T50 (Operational Test Agency Assessment) continued
- (U) FY 1990 Planned Program:
 - o Issue independent evaluation plan (IEP) for the first early operational assessment (EOA).
 - o Approve test design plan for first EOA.
 - o Initiate training for evaluation team.
 - o Identify Agency that will be operational tester.
- (U) FY 1991 Planned Program:
 - o Conduct first early operational assessment (EOA).
 - o Issue independent evaluation report (IER) for first EOA.
 - o Issue independent evaluation plan (IEP) for second EOA.
- (U) Work Performed By: JTC3A/Joint Interoperability Test Center (JITC); Ft. Huachuca, AZ; other contractors to be determined.
- (U) Related Activities: None. There is no duplication of effort within the Agency.
- (U) Other Appropriation Funds: None.
- (U) International Cooperative Agreements: None.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

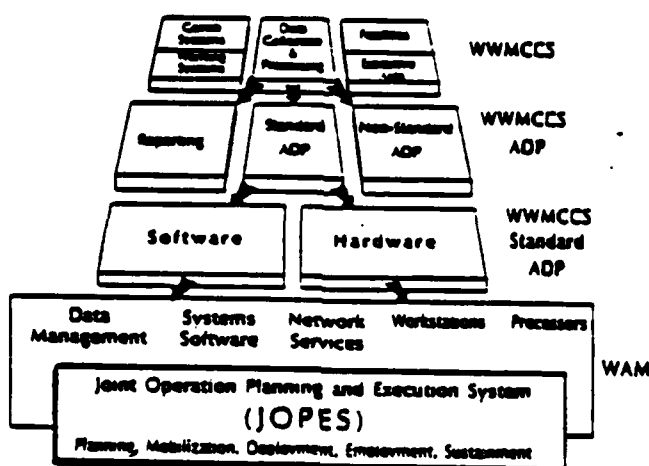
Program Element: 0303154K

PE Title: WWMCCS ADP Modernization (WAM) Program

Project: J06

Budget Activity: 03

Project Title: WWMCCS ADP Modernization



POPULAR NAME: WAM

A. (U) SCHEDULE/BUDGET INFORMATION (\$ in Thousands):

SCHEDULE	FY 1989	FY 1990	FY 1991	TO COMPLETE
Program Milestones	N/A	JOPEs Version 1&2 DAB Qtr 2 MAISRC Qtr 2	JOPEs Version 3&4 JOPEs Early Oprn Assess	Complete
Engineering Milestones	N/A	N/A	N/A	TBD
T&E Milestones	N/A	CDR JOPEs Version 1&2	CDR JOPEs Version 3&4	Complete
Contract Milestones	GTE Contract	Ongoing	Ongoing	Ongoing
BUDGET (\$000)	FY 1989	FY 1990	FY 1991	PROGRAM TOTAL (TO COMPLETE)
Major Contract	N/A	0	0	0
Support Contract	N/A	46,797	54,427	Continuing
In-house Support	N/A	0	0	0
GFE/ Other	N/A	0	0	0
Total		46,797	54,427	TBD

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303154K

Project: J06

PE Title: WWMCCS ADP Modernization (WAM) Program

Budget Activity: 03

B. (U) BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEM CAPABILITIES:

WAM will improve the Worldwide Military Command and Control System (WWMCCS) Standard ADP (Automated Data Processing) hardware and software systems that support the conventional force command and control activities of the National Command Authority (NCA), Joint Chiefs of Staff (JCS), and the Unified and Specified commands. The overall objective of WAM is to improve our Nation's ability to formulate and execute a credible conventional military response to world events that threaten our national interest. Improvements will be achieved by applying modern information systems tools and technology to the tasks of planning, mobilizing, deploying, employing, sustaining, and monitoring a conventional military operation. WAM is not a major defense acquisition program in the classical sense. While the program will initially be subject to Defense Acquisition Board (DAB) oversight, the strategy for achieving the above objective consists of fielding increments of capability until the Joint Operations Planning and Execution System (JOPES) Required Operational Capability (ROC) is satisfied. WAM will also evaluate, test, and select government and commercial non-developmental products for integration into WWMCCS Standard ADP environment as qualified WWMCCS Standard ADP products. Sites will acquire qualified products from requirements contracts put in place by one of the services or Defense Agencies acting as a Lead Military Department (LMD) for acquisition.

C. (U) PROGRAM ACCOMPLISHMENTS AND PLANS:

(U) FY 1989 Accomplishments:

- o Prior to FY 1990, this program was funded by the AF under the name, "WWMCCS Information System (WIS). On 6 Mar 89, the Deputy Secretary of Defense issued an Acquisition Decision Memorandum transferring the executive agency responsibilities for WWMCCS standard ADP modernization from the Air Force to DCA. FY 1989 accomplishments included herein were funded through reimbursement by the Air Force.
- o Independent government cost estimate completed.
- o Began preparation for DAB Program Assessment.

(U) FY 1990 Planned Program:

- o Field JOPES Version 1.
- o Design, code, test & field JOPES version 2.
- o Design, code, & begin testing JOPES versions 3 & 4.
- o Initiate JOPES standards development.
- o Initiate JOPES information engineering data standardization.
- o Participate in DAB program assessment.
- o Participate in MAISARC program assessment.

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Program Element: 0303154K
PE Title: WWMCCS ADP Modernization (WAM) Program

Project: J06
Budget Activity: 03

(U) FY 1991 Planned Program:

- o Complete testing & field JOPES Version 3 and 4 (JOPES IOC).
- o Continue JOPES standards development.
- o Continue JOPES information engineering data standardization.
- o Complete development (design, code and development test) of JOPES version 5.
- o Begin development (design and code) of JOPES version 6.

(U) Program to Completion: Continue standards & information engineering support for JOPES.

D. (U) WORK PERFORMED BY: GTE, Billerica, MA; Joint Data Systems Support Center (DCA), U.S. Transportation (USTRANSCOMM) and JOPES Project Group (JPG).

E. (U) COMPARISON WITH FY REVISED 1990/FY 1991 DESCRIPTIVE SUMMARY: The net increase of \$3.3 million from the April 1989 revised budget represents a rephasing of the financial profile between FY 1990 and FY 1991.

F. (U) PROGRAM DOCUMENTATION:

Joint Mission Element Need Statement	Feb 82
Operational Information Requirement	
including Joint Operations Planning &	
Execution System Required Operational	
Capability (ROC)	Jul 83
Test & Evaluation Master Plan	Sep 89
Decision Coordinating Paper (DCP)	Jan 90
Integrated Logistics Support Plan (ILSP)	Sep 89

G. (U) RELATED ACTIVITIES: Related program elements are Program Elements #0303151F (Worldwide Military Command and Control System (WWMCCS)); #0303152F (Air Force WIS); #0303152A (Army WIS); #0303152N (Navy WIS); #0303152K (Defense Communications Agency WIS); #0303152H (Defense Nuclear Agency (WWMCCS ADP)); #0701111M (Marine Corps (Management Headquarters (Admin))). Coordination and guidance is processed through the WAM Program Management Office. There is no unnecessary duplication of effort within the Department of Defense.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303154K

Project: J06

PE Title: WWMCCS ADP Modernization (WAM) Program

Budget Activity: 03

H. (U) OTHER APPROPRIATION FUNDS:

- o Operation & Maintenance: \$4,789K (FY 1990); \$2,093 (FY 1991)
- o Procurement: \$2,020K (FY 1991)

I. (U) TEST AND EVALUATION DATA:

o Development Test and Evaluation (DT&E): DT&E will be conducted in accordance with the WWMCCS ADP Modernization (WAM) Test and Evaluation Master Plan. The Operational Support Facility, located at DCA, Sterling, VA, will be used to conduct DT&E of most WAM products.

o Operational Test and Evaluation (OT&E): OT&E will be under the auspices of DCA's independent Operational Test Agency (OTA). Establishment of a dedicated WAM OTA test team under the Agency's Joint Interoperability Test Center (JITC) at Ft. Huachuca is underway. This OT&E effort is funded separately under Project T50 (Operational Test Agency Assessment).

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0201135K

Title: CINC Command & Control Initiatives

Budget Activity: .04

A. RESOURCES (Dollars in \$000)

Project Number & Title	FY 1989 <u>Actual</u>	FY 1990 <u>Estimate</u>	FY 1991 <u>Estimate</u>	To <u>Complete</u>	Total <u>Program</u>
C35 CINC C ² Initiatives	1,877	1,913	1,974	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element provides the Commanders in Chiefs (CINCs) the capability to implement timely, low cost near-term improvements to enhance their command and control systems in response to dynamic operational situations worldwide. The program results in discernible improvements in readiness by enhancing the CINCs' ability to exercise command and control over their forces.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) Project Number and Title: C35 (CINC C² Initiatives) Low cost projects are developed by the CINCs in response to unique requirements that arise due to unforeseen world tactical situations. Results provide discernible improvements to the readiness and combat capabilities of the CINCs.

(U) FY 1989 Planned Accomplishments:

- o Implemented the Focal Point Automation Project
- o Initiated the Strategic Relocatable Targets (SRT) Architecture and Master Plan
- o Implemented Map Generator and Display Capabilities project system

(U) FY 1990 Planned Program:

- o Develop a portable remote telecommunications system capable of processing true color imagery
- o Provide MITRE support to research alternative methods of SIOP and conventional planning
- o Develop a space system architecture and master plan
- o Develop a Strategic Relocatable Target (SRT) technical requirements document to support SRT System Architecture

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0201135K

Title: CINC Command & Control Initiatives

Budget Activity: 04

(U) Project C35 (CINC C² Initiatives) continued:

(U) FY 1991 Planned Program:

- o Provide continued low-cost near-term enhancement to C2 systems in response to operational situations
- o Develop a CINCLANT energy location transmitter locator
- o Develop a space target optimization modeling program
- o Provide survivability analysis of TW/AA Communications Network
- o Develop theater reception & onboard movement Command & Control Architecture Interpretation

(U) Program to Completion: This is a continuing program

(U) Work Performed By: Numerous contractors and agencies worldwide

(U) Related Activities: None

(U) Other Appropriation Funds: None

(U) International Cooperative Agreements: Not applicable

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K

Budget Activity: 04

PE Title: C3 Interoperability (Joint Tactical C3 Agency)A. (U) RESOURCES (Dollars in \$000)

PROJ TITLE NO.	FY 1989 <u>Actual</u>	FY 1990 <u>Estimate</u>	FY 1991 <u>Estimate</u>	To <u>Complete</u>	Total <u>Program</u>
T10 Procedural Interoperability	17,542	13,575	16,330	Continuing	Continuing
T20 Joint Interoperability Evaluation System	16,042	15,417	3,850	Continuing	Continuing
T30 Technical Interoperability	24,015	23,690	22,967	Continuing	Continuing
T40 Joint Interoperability Test Center	1,000	1,615	3,535	Continuing	Continuing
A20 Miscellaneous Tactical C3 Support	100	0	0	Complete	Complete
TOTAL	58,699	54,297	46,682		

B. (U) BRIEF DESCRIPTION OF ELEMENT: The Agency is chartered to ensure the interoperability of tactical C3 systems for joint and combined operations (including nonstrategic nuclear forces) through the development and maintenance of a joint architecture, interface standards and interface definitions. The Agency must also test the procedural and technical interface standards developed for tactical C3 systems and verify that approved standards have been implemented properly. The Agency receives guidance and direction from the Assistant Secretary of Defense (C3I) in matters relating to systems engineering and acquisition and from the Joint Staff for systems involving planning, requirements, development and procedures. Narrative justification for Projects T10, T20, and T30 is addressed in separate individual formats on the following pages.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) PROJECT T40 (JOINT INTEROPERABILITY TEST CENTER): Project T40 (Joint Interoperability Test Center) - This project will consolidate the JTC3A testing resources into a new organization at Fort Huachuca, AZ to provide greater testing, more efficient use of testing resources and better management control. The new organization, the Joint Interoperability Test Center (JITC), will consist of the existing Logistics Support Facility, the existing Joint Test Facility (JTF), remote test locations, and a new test facility. Procedural testing will be conducted using the Joint Interoperability Evaluation System (JIES) under development by Martin-Marietta. The JIES, which will incorporate Tactical Digital Information Links (TADILs) A, B, and J procedural testing under a single system, will be installed in three phases. A Program Management Office has been established at Fort Huachuca to manage the transition from current operations into the new organization of a new facility.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K

Budget Activity: 04

PE Title: C3 Interoperability (Joint Tactical C3 Agency)

(U) Project T40 continued:

(U) FY 1989 Accomplishments:

- o Began consolidation of Joint Interface Test Force (JITF) and preparation for JIES integration into the test facility
- o Oversaw completion of JITC building construction and integration of communication facility

(U) FY 1990 Planned Program:

- o Continue consolidation into new test facility
- o Begin transition of procedural testing from Joint Interface Test Force at Fort Monmouth
- o Conduct of technical and procedural testing in accordance with approved Five Year Interoperability Assurance Program (FYIAP) schedule

(U) FY 1991 Planned Program:

- o Continue transition of procedural testing
- o Conduct of technical and procedural testing in accordance with approved Five Year Interoperability Assurance Program (FYIAP) schedule

(U) Program to completion: This is a continuing program

(U) Work Performed By: Military and civilian personnel of the JTC3A activities; Mantech Field Engineering Corp, McLean, VA; and COMCON Inc., Moorestown, NJ.

(U) Related Activities: DCA is the Program Director for the Joint Interoperability of Tactical Command and Control Systems (JINTACCS) program. Service participation in this joint program is supported by Program Elements # 0604779A (JINTACCS); # 0604779F (JINTACCS); # 0604780M (JINTACCS); and # 0205604N (Tactical Information Systems (partial)). Close coordination between the Agency and the Services on program activities and objectives precludes duplication of efforts.

(U) Other Appropriation Funds: None

(U) International Cooperative Agreements: Not applicable

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
 PE Title: C3 Interoperability (JTC3A)

Project Number: T10
 Budget Activity: 04

A. (U) RESOURCES (Dollars in \$000)

Project Title: Procedural Interoperability

<u>Popular</u> <u>Name</u>	<u>FY 1989</u> <u>Actual</u>	<u>FY 1990</u> <u>Estimate</u>	<u>FY 1991</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Procedural Interoperability	17,542	13,575	16,330	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEM CAPABILITIES:

This project involves continued development, testing, and configuration management associated with procedural interface standards required for Joint and Combined tactical operations. The objective is to significantly improve effectiveness of Joint and Combined tactical operations by providing common standards for timely and accurate transmittal of operational information. Two categories of procedural interface standards exist: (1) U.S. Message Text Format (MTF) standards which cover voice and written messages; and (2) Tactical Digital Information Link (TADIL) standards which cover computerized, automated data messages. Current TADIL standards cover JCS approved operational Joint Tactical Air Operations (JTAO) interfaces. A new standard, TADIL J, which will provide interface for Joint Tactical Information Distribution System (JTIDS), is under development.

C. (U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. FY 1989 Accomplishments:

- o Continued support to CINCs, Services, and Agencies (C/S/A) in implementing MTFs
- o Assisted in developing C/S/A unique and routine/administrative MTFs
- o Continued testing and configuration management of MTF, JTAO, and TADIL standards
- o Provided technical support to U.S. Delegates/Chairmen participating in NATO tactical C2 fora and supported multiple combined interoperability programs with Pacific allies

2. FY 1990 Planned Program:

- o Continue support to C/S/A in implementing MTFs
- o Continue testing, configuration management and technical support of MTF, JTAO, and TADIL J standards
- o Continue to provide technical support to U.S. Delegates/Chairmen participating in NATO tactical C2 fora and support multiple, combined interoperability programs with Pacific allies
- o Complete development of Joint Portable TADIL Tester (JPTT)

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T10
Budget Activity: 04

C. (U) PROGRAM ACCOMPLISHMENT AND PLANS: (Continued)

3. FY 1991 Planned Program:

- o Continue support to C/S/A in implementing MTFs
- o Assist in developing C/S/A unique and routine/administrative MTFs
- o Continue testing and configuration management of MTF, JTAO, and TADIL standards
- o Conduct interoperability testing of operational MTF/TADIL standards
- o Provide technical support to U.S. Delegates/Chairmen participating in NATO tactical C2 forums, and support multiple, combined interoperability programs with Pacific allies
- o Provide assistance to C/S/A for their TADIL J developments and test combined/Allied nations TADIL systems

4. Program Plan to Completion: This is a continuing program.

D. (U) WORK PERFORMED BY: Military and civilian personnel of the JTC3A activities; BDM Corp., McLean, VA; Nations, Shrewsbury, NJ; and the MITRE Corp, Bedford MA.

E. (U) COMPARISON WITH FY 1990/1991 DESCRIPTIVE SUMMARY: No change from prior submission.

F. (U) PROGRAM DOCUMENTATION: Not applicable

G. (U) RELATED ACTIVITIES: DCA is the Program Director for the Joint Interoperability of Tactical Command and Control Systems (JINTACCS) program. Service participation in this joint program is supported by Program Elements # 0604779A (JINTACCS); 0604779F (JINTACCS) # 0604780M (JINTACCS); and # 0205604N (Tactical Information Systems (partial)) Close coordination between the Agency and the Services on program activities and objectives precludes duplication of efforts.

H. (U) OTHER APPROPRIATION FUNDS: Not applicable

I. (U) INTERNATIONAL COOPERATIVE AGREEMENTS: Under the Nunn Amendment Initiative, \$7.6 million has been identified for use over a three year period in pursuing combined procedural standards interoperability projects with NATO allies. A Memorandum of Understanding (MOU) for NATO Procedural Interoperability Standards (NPIS) was signed in December 1988 between the U.S. and other participating NATO nations. JTC3A is currently exploring NUNN agreements in the Pacific region.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T10
Budget Activity: 04

J. (U) MILESTONE SCHEDULE:

Joint CCB of Army Tactical Data Link-1 (ATDL-1)	Apr 1989
Commence Joint Interface Test Force (JITF)	Jan 1990
Relocation to Fort Huachuca	
Begin TADILs A&B Test at Fort Huachuca	Apr 1990
CDBS Software Merges Data Base with Word Processing/Graphics for Pub 25 Support	Apr 1990
Complete Joint Portable TADIL Tester (JPTT) Development	May 1990
Achieve Joint CM of Interim JTIDS Message Specification (IJMS) and Variable Message Format (VMF)	May 1991
Achieve Joint CM of VHM	Jun 1991
Optical Disk Distribution System Capability	Oct 1991

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
 PE Title: C3 Interoperability (JTC3A)

Project Number: T20
 Budget Activity: 04

A. (U) RESOURCES (Dollars in \$000)

Project Title: Joint Interoperability Evaluation System (JIES)

<u>Popular</u> <u>Name</u>	<u>FY 1989</u> <u>Actual</u>	<u>FY 1990</u> <u>Estimate</u>	<u>FY 1991</u> <u>Estimate</u>	<u>To</u> <u>Complete</u>	<u>Total</u> <u>Program</u>
Joint Interoperability Evaluation System (JIES)	16,042	15,417	3,850	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEM CAPABILITIES: The Joint Interoperability Evaluation System (JIES) is a development program initiated by the Joint Tactical Command, Control and Communications Agency (JTC3A) to acquire the capability to ensure, through test, the compatibility and interoperability of DoD Service and Agency Tactical Data Systems when used in joint and combined operations. The JIES development emphasis is directed toward the capability to validate the Tactical Digital Information Link (TADIL A, B, J) standard and certify the systems that implement them. When completed, the development program will also replace the Joint Interoperability Test Systems (JITS) currently used by the Joint Interface Test Force (JITF) to test interoperability of tactical data systems that use TADILs A and B standards. The JIES consists of a central test facility located at the Joint Interoperability Test Center (JITC), Ft. Huachuca, AZ, and a number of remote test facilities located at individual Service/Agency tactical data system sites. The central test facility is the connection point by which widely dispersed Service and Agency tactical data systems are able to communicate with each other as though they were deployed in the same area of operations. The JIES monitors the data flow between the tactical data systems, collects the data, analyzes it, and manages the information flow by controlling the scenario and sensor simulation inputs into the tactical data systems in accordance with JITF furnished test procedures. The results are used by JTC3A to support a recommendation to the Joint Staff for certification of specific systems for use in joint and combined operations.

C. (U) PROGRAM ACCOMPLISHMENT AND PLANS:1. FY 1989 Accomplishments

- o Procured and assembled 90% of JIES hardware
- o Continued development of the JIES
- o Began procedures for JIES System Integration Testing
- o Began preparation for full JIES integration into the JITC at Ft Huachuca, AZ
- o Continued preparations for Developmental Certification Testing (DCT)
- o Completed Preliminary and Critical Software Design Reviews

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T20
Budget Activity: 04

C. (U) PROGRAM ACCOMPLISHMENT AND PLANS:

2. FY 1990 Planned Program:

- o Complete Systems Integration Testing
- o Begin installation and checkout at JITC and Service/Agency sites

3. FY 1991 Planned Program:

- o Begin DCT of C2 systems integrated under the JIES development
- o Complete System Acceptance Testing at JITC
- o Installation and checkout complete
- o Begin preparation for integrating additional S/A systems into JIES testbed

4. Program Plan to completion:

- o Complete delivery of software/hardware requirements to conduct operational maintenance testing of TADIL A, B, and J procedural interfaces.
- o Operate with a complete capability for DCT and testing of C2 systems
- o Develop a Testbed Upgrade program to meet all testing requirements in accordance with the Five Year Interoperability Assurance Plan (FYIAP).

D. (U) WORK PERFORMED BY: Military and civilian personnel of the JTC3A activities; Martin Marietta, Denver, CO; Intermetrics, Inc., Warminster, PA; and The MITRE Corp, Bedford, MA.

E. (U) COMPARISON WITH FY 1990/ FY 1991 DESCRIPTIVE SUMMARY: The change from the FY 1990/FY 1991 Descriptive Summary is a result of restructuring the spend plan as provided under the Fixed Price Incentive Fee (FPIF) contract and reflects current program requirements.

F. (U) PROGRAM DOCUMENTATION: Not applicable

G. (U) RELATED ACTIVITIES: Close coordination between the Agency and the Services on program activities and objectives to preclude duplication of efforts.

H. (U) OTHER APPROPRIATION FUNDS: Not applicable

I. (U) INTERNATIONAL COOPERATIVE AGREEMENTS: Not applicable

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T20
Budget Activity: 04

J. (U) MILESTONE SCHEDULE:

Preliminary Design Review	Feb 1989
Critical Design Review	Aug 1989
Start System Integration Test	Jun 1990
Complete System Integration Testing	Aug 1990
Start Installation and check out at JITC	Sep 1990
Begin System Acceptance Testing	Jan 1991
Complete System Acceptance Testing	Apr 1991
Begin Developmental Certification Testing (TADIL A, B,J)	Apr 1991
Begin Development of additional Remote Test Facilities for C2 Systems as required by the FYIAP	Jun 1991
Complete Automation of Test Preparation and Analysis Function	Dec 1991

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T30
Budget Activity: 04

A. (U) RESOURCES (Dollars in \$000)

Project Title: Technical Interoperability

Popular Name	FY 1989 Actual	FY 1990 Estimate	FY 1991 Estimate	To Complete	Total Program
Technical Interoperability	24,015	23,690	22,967	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEM CAPABILITIES:
This project is to ensure technical interoperability of tactical C3 among the Military Services and allies in joint and/or combined operations. Primary tasks include (1) analyzing CINC, Service and Allied Nation C3 interoperability needs, requirements, and problems through the development of interoperability architectures; (2) developing and providing CINCs with software tools to facilitate C3 systems operational planning; (3) performing technology and system assessments; (4) developing and maintaining JTC3A Technical Interface Specifications (TISs); (5) managing the Interoperability Improvement Program (IIP); (6) reviewing tactical C3I test documents, requirements documents, Test and Evaluation Master Plans (TEMPS), and fielding plans to ensure joint/combined interoperability; (7) developing and maintaining Tactical Communications Systems Technical Standards (TDTS) under the Defense Standardization and Specification Program (DSSP) and NATO Standardization Agreements (STANAGs) under the Tri-Service Group for Communications-Electronics (C-E) equipment; and (8) managing the testing program and testing systems/equipment to verify the interoperability and compliance with standards/specifications.

C. (U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. FY 1989 Accomplishments:

- o Initiated Intelligence and Joint Task Force Operational Control Functional Interoperability Architecture (FIA)
- o Completed the Special Operations, Land Combat Operations, Combat Services Support and Fire Support FIAs
- o Completed JTF Aleutian CINC Interoperability Architecture (CIA)
- o Completed USEUCOM CINC Interoperability Architecture (CIA)
- o Continued development of Maritime Operation and Air Operations FIAs
- o Initiated Intelligence and JTF Operational Control FIAs
- o Continued development of USFORSCOM CIA
- o Initiated development of CINC Interoperability Planning System
- o Completed system assessments on Interoperability Implications of Standardized COMSEC Modules, Joint Surveillance Target Attack Radar System (Joint STARS), and Combat Identification System (CIS)
- o Completed technology assessment on Very High Frequency (VHF) Radios

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T30
Budget Activity: 04

C.(U) PROGRAM ACCOMPLISHMENT AND PLANS:

1. FY 1989 Accomplishments (Continued):

- o Completed the High Frequency Self Interference Study and the development of the HF radio self interference computer model
- o Initiated Interoperability Training and Awareness Program
- o Conducted 21 planned Five Year Interoperability Assurance Program (FYIAP) and 50-plus Non-FYIAP tests

2. FY 1990 Planned Program

- o Complete Maritime, Air Operations, Joint Task Force Operational Control, and Intelligence FIAs
- o Initiate CINC Interoperability Architecture for ALCOM and SAC
- o Initiate updated and expanded FIAs for Fire Support and Air Defense/Air Space Control
- o Continue development of CINC Interoperability Planning System
- o Complete system assessments on Joint Tactical Fusion, Limited Echelons Above Corps Communications, and Joint STARS (NATO)
- o Complete technology assessments on Data Switching , and Super High Frequency (SHF)/Extremely High Frequency (EHF) Electronic Counter-Counter Measures (ECCM)
- o Complete preparation of MIL-STD-188-148A on HF ECCM
- o Continue IIP efforts and FYIAP and Non-FYIAP Testing
- o Continue consolidation of Joint Interface Test Force (JITF) and Joint Interoperability Evaluation System (JIES) into new Joint Interoperability Test Center (JITC)

3. FY 1991 Planned Program

- o Complete CINC Interoperability Architecture for ALCOM
- o Continue development of CINC Interoperability Planning System
- o Complete updated and expanded FIA for Fire Support and Air Defense/Air Space Control joint functional areas
- o Continue CINC Interoperability Architecture for SAC
- o Initiate development of Joint and Combined C2 Interoperability Architectures for selected CINCS.
- o Initiate development of Joint Tactical C2 Objective Interoperability Architecture
- o Initiate new system and technology assessments
- o Complete assessments on Time of Day Distribution, High Frequency Programs (Combined), and Low Rate Voice Processing
- o Continue IIP efforts and FYIAP and Non-FYIAP testing
- o Continue consolidation of JITF and JIES into new Joint Interoperability Test Center (JITC)

4. Program Plan to Completion: This is a continuing program

D. (U) WORK PERFORMED BY: Military and civilian personnel of the JTC3A activities; BDM Corp., McLean, VA; and the MITRE Corp, Bedford MA.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208045K
PE Title: C3 Interoperability (JTC3A)

Project Number: T30
Budget Activity: 04

E. (U) COMPARISON WITH FY 1990/FY 1991 DESCRIPTIVE SUMMARY: The change from the FY 1990/FY 1991 Descriptive Summary will impact the procurement of capital investment equipment for the Joint Interoperability Test Center (JITC).

F. (U) PROGRAM DOCUMENTATION: Not applicable

G. (U) RELATED ACTIVITIES: Service participation in this joint program is supported by Program Elements: 0604779A (JINTACCS); 0604779F (JINTACCS); 0604780M (JINTACCS); and, 0205604N (Tactical Information Systems) (partial). Close coordination between the Agency and the Services on program activities and objectives to preclude duplication.

H. (U) OTHER APPROPRIATION FUNDS: Not applicable

I. (U) INTERNATIONAL COOPERATIVE AGREEMENTS: Nunn funding authority totalling \$2.0 million was provided in Program Element #0603790D to provide NATO program support in the area of Post 2000 Tactical Communications. The cooperative agreement, involving ten NATO nations, will result in a series of pre-feasibility studies leading to an architecture and the identification of standardization agreements for the tactical communications system for the land combat zone - post 2000. The MOU was initially signed in April 1988 and is for a three-year period. Allied contributions will be at least \$750K per nation over the three years.

J. (U) MILESTONE SCHEDULE:

Completed JITC Military Construction	Jun 1989
Completed Testing of HF Modems	Sep 1989
Complete Limited Echelon Above Corps Assessment	Feb 1990
Complete Intelligence and Maritime FIAs	Mar 1990
Complete Joint Tactical Fusion Assessment	Apr 1990
Complete Data Switching Technology Assessment	May 1990
Complete SHF/EHF ECCM Technology Assessment	May 1990
Complete High Frequency Self Interference Wideband Study	May 1990
Complete JTF Operational Control FIA	Sep 1990
Complete updated and expanded FIA for: Air Defense/Air Space Control	Aug 1991
Fire Support	Aug 1991
Complete CINC Interoperability Architecture for PACOM/ALCOM	Jan 1991
Complete CINC Interoperability Architecture for SAC	Sep 1992

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: # 0208298K Budget Activity: 04
 PE Title: Management Headquarters (Joint Tactical C3 Agency)

A. (U) RESOURCES (Dollars in \$000)

<u>Proj Title/ Number</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
Management Headquarters	5,977	6,459	6,589	Continuing	Continuing

B. (U) BRIEF DESCRIPTION OF ELEMENT: The Joint Tactical Command, Control and Communications Agency (JTC3A) activities are currently located at Fort Monmouth, NJ, Reston, VA and Fort Huachuca, AZ. This program element funds the payment of civilian salaries and other support costs specifically identified with the headquarters element of the JTC3A and reimbursement to the Army for administrative and operating support provided to the JTC3A. Army administrative/operating support is provided to the JTC3A in accordance with DoD Directive 4000.19, "Inter-service, Interdepartmental and Interagency Support."

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) FY 1989 Accomplishments:

- o Continued direct costs for the headquarters activities which include civilian salaries and benefits, travel, supplies and equipment
- o Continued reimbursement to the Army for administrative and operating support at Forts Monmouth and Huachuca

(U) FY 1990 Planned Program:

- o Continuing direct costs for the headquarters activities which include civilian salaries and benefits, travel, supplies and equipment
- o Continuing reimbursement to the Army for administrative and operating support at Forts Monmouth and Huachuca

(U) FY 1991 Planned Program:

- o Continuing direct costs for the headquarters activities which include civilian salaries and benefits, travel, supplies and equipment
- o Continuing reimbursement to the Army for administrative and operating support at Forts Monmouth and Huachuca

(U) WORK PERFORMED BY: Civilian and military personnel assigned to the headquarters activity of the JTC3A; and BDM, McLean, VA.

(U) RELATED ACTIVITIES: Not applicable

(U) INTERNATIONAL COOPERATIVE AGREEMENTS: Not applicable

(U) OTHER APPROPRIATION FUNDS: Not applicable

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

A. (U) RESOURCES (Dollars in \$000):

<u>Project Number & Title</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
D11 Drug Enforcement Telecommunications	0	2300	0	Continuing	Continuing
D22 Integrated Design (ID)	837	325	234	Continuing	Continuing
D23 System Control (SC)	490	1,137	1,242	Continuing	Continuing
D41 Jam Resistant Secure Communications (JRSC)	265	713	730	Continuing	Continuing
D42 Terrestrial Transmission (TT)	1,183	1,219	1,618	Continuing	Continuing
D43 Defense Satellite Communications System (DSCS)	3,127	3,376	3,778	Continuing	Continuing
D52 DSN Networking and System Engineering (DSN)	3,067	3,402	3,419	Continuing	Continuing
D61 Integrated Data System (IDS)	6,338	5,664	5,641	Continuing	Continuing
D62 Protocol Development Test & Stds (PDTS)	2,444	1,989	2,670	Continuing	Continuing
D63 Defense Message System (DMS)	0	0	293	Continuing	Continuing
D75 DCS Network Design and Performance Analysis (DNDPA)	400	293	299	Continuing	Continuing
D76 Communication Standards (CS)	471	350	336	Continuing	Continuing
S50 DCS Architectural Standards Support	0	0	256	Continuing	Continuing
W11 Presidential Telecommunications System (PTS)	273	0	0	Restructured	Continuing
W26 White House Situation Spt Staff	266	0	0	Restructured	Continuing
Total	19,161	20,768	20,516		

B. (U) BRIEF DESCRIPTION OF ELEMENT: The Defense Communications System (DCS) RDT&E program element supports the development and systematic improvement of the DCS to provide Defense-wide communications for the day-to-day operations of the DoD and to serve as the core of DoD wartime communications for the National Command Authorities (NCA), the Joint Chiefs of Staff (JCS), the Commanders in Chief (CINCs), and other critical users. It provides the systems engineering, development, test, and evaluation necessary to modernize the aging DCS and to transition to a Defense

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

Information System. It emphasizes DCS survivability, endurability, security, and interoperability over a variety of stress conditions. It designs a robust DCS capable of continued command and control support as survivable as its users. It provides for rapid extension of service to remote areas and quick restoration of disrupted service.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN BOTH FY 1990 AND 1991:

(U) Project Number and Title: D11 (Drug Enforcement Telecommunications) - This project provides system level engineering and testing/evaluation associated with DCA's mission as the lead agency to implement the DoD funded portion of the Drug Enforcement Telecommunications Plan (DETIP) and the communications system that supports the congressionally assigned detection and monitoring function.

(U) FY 1989 Accomplishments: Not Applicable

(U) FY 1990 Planned Program:

- o Develop interface requirements for systems specified in the DETIP.
- o Equip test center(s) with necessary hardware.
- o Investigate circuit speed enhancements for DETIP data networks.

(U) FY 1991 Planned Program: To Be Determined

(U) Work Performed by: DCA, DCSO, C4S, JTC3A; MITRE.

(U) Related Activities: This project complements ongoing system integration efforts within the DCS, but is focused on specific interface issues related to the hardware and software identified for procurement in this project.

(U) Other Appropriation Funds: Operations and Maintenance \$2957K (FY 1989); Procurement \$60,500K (FY 1989).

(U) International Cooperative Agreements: Not Applicable.

(U) Project Number and Title: D22 (Integrated Design) - The primary support for the 1995 DCS, which provides the major stepping-stone to Vision 21, is contained within this Integrated Design project. This project provides vital system level engineering for a wide range of engineering planning, guidance, analysis, and coordination of all major elements of the evolving digital DCS. Vision 21 is the Agency's strategic planning process to guide it into the 21st century.

(U) FY 1989 Accomplishments:

- o Continued technical support for Vision 21, which provides for Integrated Services Digital Network, Defense Message Service and an Integrated Transmission Allocation Network.
- o Updated migration plan to the Integrated Services Data Network (ISDN).
- o Initiated T-1 networking study.

(U) FY 1990 Planned Program:

- o Support Vision 21 and DCS Master Plan.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D22 (Integrated Design) - Continued
 - o Produce initial issue of the Integrated DCS Node Specification.
- (U) FY 1991 Planned Program:
 - o Update Integrated DCS Node specification.
- (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, DCSO; American Telephone and Telegraph.
- (U) Related Activities: The DCA RDT&E resources are principally oriented toward: advanced concepts, system engineering, trade-off studies, simulations, analyses, functional performance specifications, system integration, and test and evaluation support. The Military Departments' and other agencies' resources complement the DCA effort with principal emphasis on: engineering design and tradeoff analyses, advanced engineering development models, equipment integration, production specifications, and operational system test and evaluation. This project relates to other C3 improvement projects in Program Elements #0303126F (Long Haul Communications), #0303126A (Long Haul Communications), and #0303126N (Long Haul Communications). There is no duplication of effort.
- (U) Other Appropriation Funds: None.
- (U) International Cooperative Agreements: Not Applicable.
- (U) Project Number and Title: D23 (System Control) - The objective of this task is to develop an integrated and survivable system control which best meets the DCS users' needs under wartime conditions.
- (U) FY 1989 Accomplishments:
 - o Specified, designed and developed Integrated System Control specifications to include Defense Information System Telecommunications Management Network (DTMN) data base design, DTMN security design, DCS Central Area (CA) control system, and control center man-machine interface improvements.
 - o Used DPAS Network Control System (DNCS) simulator to evaluate DNCS routing algorithms under stressed environments.
- (U) FY 1990 Planned Program:
 - o Develop engineering specifications for the DCS-Central Area Control system with particular emphasis on integration with the Defense Information System Telecommunications Management Network (DTMN).
 - o Implement a DPAS Network Control System (DNCS) Test bed to evaluate its usefulness.
 - o Initiate concept analysis for contingency/mobile DTMN.
 - o Perform DCA Operations Center (DCAOC) DTMN subsystem engineering/integration.
 - o Continue the engineering planning for the multi-level secure DCS control system.
 - o Participate in network management control standards forums and working groups.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D23 (System Control) - Continued
 - (U) FY 1991 Planned Program:
 - o Develop necessary prototype DTMN interface subsystem for DCS-Central Area system control.
 - o Evaluate DNCS test bed results.
 - o Develop engineering system design for contingency/mobile DTMN.
 - o Continue DCAOC subsystem engineering integration with DTMN.
 - o Finalize DTMN multi-level security specification.
 - (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, DCSO; Planning and Research Corporation (PRC), McLean, VA; American Telephone and Telegraph, Bell Labs, NJ.
- (U) Related Activities: The Defense Information System Telecommunications Management Network (DTMN) is related to the Air Force Rome Air Development Center (RADC) effort for an Expert System for Integrated DCS System Control funded under Program Element #0303126F (Long Haul Communications). There is no duplication of effort.
- (U) Other Appropriation Funds: Operations and Maintenance: \$823K (FY 1989); \$900K (FY 1990) and \$434K (FY 1991).
- (U) International Cooperative Agreements: Not Applicable
- (U) Project Number and Title: D41 (Jam Resistant Secure Communications)
 - The JRSC adds a robust communications overlay to other DCS networks to provide HEMP-protected, scintillation-mitigated, jam-resistant, and secure communications among the NCA and the CINC's during crises and nuclear war. JRSC supports the distribution of Tactical Warning and Attack Assessment (TW/AA) data to critical nodes, decision making conferences, and the dissemination of Emergency Action Messages (EAM's). This project supports planning, transitioning engineering and test and evaluation.
- (U) FY 1989 Accomplishments:
 - o T&E performance and survivability of existing and planned JRSC networks, the SCP Early Operational Capability (EOC) improvements and the Survivable Communications Integration System (SCIS).
- (U) FY 1990 Planned Program:
 - o Provide technical support for the transition and integration of additional force management elements (ship, aircraft and other mobile users) and for the integration of mitigated modified modems into SCP.
 - o Evaluate and verify JRSC HEMP hardening in accordance with MIL-STD-188-125.
- (U) FY 1991 Planned Program:
 - o Provide technical support for the transition and integration of SCIS Initial Operation Capability (IOC) into the TW/AA network and for SCP EOC improvements.
 - o T&E mobile force management communications and SCP into the mitigation modified ECCM networks.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D41 (Jam Resistant Secure Communications) - Continued
 - (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, Defense Communications System Organization (DCSO); NOSC, San Diego, CA; DNA, Washington, DC; AT&T Federal System, Greensboro, NC; MRL, Torrance, CA.
- (U) Related Activities: The USAF Systems Command ESD is developing a communications processor under Program Element #0603735F (WWMCCS Architecture). There is no duplication of effort.
- (U) Other Appropriation Funds: Operations and Maintenance: \$208K (FY 1989); \$270K (FY 1990) and \$185K (FY 1991).
- (U) International Cooperative Agreements: Not Applicable.
- (U) Project Number and Title: D42 (Terrestrial Transmission) - This RDT&E project provides system engineering support for modernization of the DCS. This includes cost effective upgrading to digital operation providing improved interoperability with tactical, common carrier and NATO Communication Networks, and improved durability and responsiveness during wartime and crisis conditions.
 - (U) FY 1989 Accomplishments:
 - o Performed interoperability T&E.
 - o Initiated automated technical control efforts.
 - o Developed clock predictability algorithm.
 - o Continued transmission network performance characterization.
 - (U) FY 1990 Planned Program:
 - o Plan DCS interoperability test program.
 - o Intra-DCS interoperability testing.
 - o Develop, test and evaluate automated tech control enhancements.
 - o Complete clock predictability algorithm development.
 - o Complete transmission network performance characterization.
 - o Enhance transmission link engineering software tools.
 - (U) FY 1991 Planned Program:
 - o Continue interoperability T&E effort.
 - o Continue technical control automation application evaluations.
 - o Develop tech control expert systems.
 - o Apply software tools to transmission link engineering.
 - (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, DCSO; DCA, JTC3A, Joint Interoperability Test Center; MITRE Corporation, McLean, VA; Institute for Telecommunications Sciences, Boulder, CO; Cincinnati Electronics Corp., Cincinnati, OH; AT&T Bell Laboratories, Holmdel, NJ; MIT Lincoln Laboratories, Lexington, MA.
- (U) Related Activities: The efforts in this project are directed towards an all digital, bulk encrypted, economical, robust DCS transmission network interoperable with tactical and strategic command and control networks. Improvements in interoperability with tactical and commercial communications networks will be provided.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D42 (Terrestrial Transmission) - Continued
This project relates to other C3 improvement projects in Program Element #0303126F (Long Haul Communications). AF/RADC provides support via hardware development and T&E of equipment. There is no duplication of effort.
- (U) Other Appropriation Funds: Operations and Maintenance: \$100K (FY 1990) and \$103K (FY 1991).
- (U) International Cooperative Agreements: Not Applicable.
- (U) Project Number and Title: D43 (Defense Satellite Communications System) - The DSCS is an integral component of the worldwide DCS designed to provide vital communications service to U.S. and allied forces by means of communications satellites. It is engineered and configured to satisfy JCS validated WWMCCS priority requirements, and to provide flexible robust communications to crises/contingency activities and the critical JRSC. This project provides the system engineering for the enhancement and the development of subsystem and/or components of DSCS to maintain its effectiveness, and for test and evaluation.
 - (U) FY 1989 Planned Program:
 - o Performed system engineering to enhance survivability of the DSCS spacecraft/ground/control subsystems.
 - o Performed system engineering for special users.
 - o Developed, tested, and evaluated expert systems for DSCS Control.
 - (U) FY 1990 Planned Program:
 - o Perform system engineering to enhance survivability of the DSCS spacecraft/ground/control subsystems.
 - o Perform system engineering for special users.
 - o Complete development, test and evaluation of expert system for DSCS Control.
 - (U) FY 1991 Planned Program:
 - o Complete system engineering for special users.
 - o Continue system engineering for DSCS III satellites number 15 and beyond.
 - (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, DCSO; USA, SATCOMA; FEMME Corp. Inc., Leesburg, VA; GTE Products Corp., Tysons Corner, VA; STel, Inc., McLean, VA.
- (U) Related Activities: Related efforts are contained in Program Element #303142A (SATCOM Ground Environment), Program Element #0303110F (DSCS Space Segment). There is no duplication of effort.
- (U) Other Appropriation Funds: Operations and Maintenance: \$480 (FY 1989); \$551K (FY 1990) and \$479 (FY 1991).
- (U) International Cooperative Agreements: Not Applicable.
- (U) Project Number and Title: D52 (Defense Switched Network (DSN) Networking and System Engineering) - The purpose of this project is to perform networking and system engineering tasks for the worldwide DSN. The

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

(U) D52 (Defense Switched Network (DSN) Networking and System Engineering) - Continued
tasks in this project focus on developing DSN capabilities in such areas as Common Channel Signalling, Integrated Services Digital Network (ISDN), Network Management Expert System, System Interfaces, Secure Voice, and Secure Voice Conferencing.

(U) FY 1989 Accomplishments:

- o Revised/updated DSN Generic Switching Center requirements including ISDN and Common Channel Signalling.
- o Designed DSN test and assessment facilities.
- o Performed DCS-Central Area engineering.
- o Formulated concepts for the next generation Secure Voice System (SVS) to insure interoperability with ISDN and advanced digital switches.
- o Evaluated feasibility of imbedded network management control.
- o Upgraded Network Management Expert System (NMES) to assist DSN controllers.

(U) FY 1990 Planned Program:

- o Revise/update system description and specification including DSN/ISDN integration engineering.
- o Develop system description for SVS/ISDN Interoperability.
- o Develop specifications for imbedded network management controls.
- o Integrate NMES and neural network technology with the Network Management Support System; and, test and evaluate.
- o Test interoperability of multi-vendor DSN switches.

(U) FY 1991 Planned Program:

- o Revise/update system description and specification including DSN/ISDN integration engineering.
- o Begin DSN/ISDN acquisition engineering.
- o Develop functional description for SVS/ISDN interoperability.
- o Enhance and update integrated network management systems.
- o Transfer technology of expert systems to DSN/DCS.
- o Test interoperability of multi-vendor DSN switches.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: DCA, DCSSO; MITRE Corporation, McLean, VA; Computer Sciences Corporation, Falls Church, VA; MIT Lincoln Laboratories.

(U) Related Activities: NSA is initiating a program for development of a ISDN compatible secure terminal under Program Element #0303401G (Communications Security). There is no duplication of effort.

(U) Other Appropriation Funds: Operations and Maintenance: \$648K (FY 1989); \$641K (FY 1990) and \$286K (FY 1991).

(U) International Cooperative Agreements: Not Applicable.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

(U) Project Number and Title: D61 (Integrated Data System) - The purpose of the IDS RDT&E Project is to improve performance and services of DCS Data Systems in support of operational user requirements and architectural goals. Secure networking, internet technology, and data network systems engineering are major areas of the project focusing on military requirements.

(U) FY 1989 Accomplishments:

- o Developed congestion and routing techniques.
- o Developed internet engineering laboratory.
- o Performed Defense Message System (DMS) system engineering.
- o Continued acquisition engineering of DDN components and systems.
- o Completed guard gateway requirements analysis.
- o Developed OSI transition gateway.
- o Planned continued integration and expansion of merged network for classified traffic.

(U) FY 1990 Planned Program:

- o Design a secure IDS monitoring and control capability.
- o Develop and test enhancements to internet gateways for congestion control and routing.
- o Perform DMS system engineering including assessing technology, formulating system concepts, and developing a transition strategy.
- o Design security enhancements.
- o Plan unclassified segment security upgrades.
- o Continue acquisition engineering of DDN components and systems.

(U) FY 1991 Planned Program:

- o Engineer and test management protocols for internet gateways.
- o Develop functional specifications for new IDS services.
- o Enhance performance of the internet system.
- o Develop and test security enhancements and internet gateways.
- o Continue upgrade of unclassified segment security enhancements.
- o Develop security architecture and interface specifications for IDS-Integrated Services Digital Network (ISDN).
- o Continue acquisition engineering of DDN components and systems.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: DCA, DCSO; MITRE Corporation, McLean, VA; Rome Air Development Center, USAF, Griffiss AFB NY; Intermetrics, Cambridge, MA; UNISYS, Camarillo, CA; Sparta, Tysons Corner.

(U) Related Activities: This project relates to Program Element #0303126F (Long-Haul Digital Communications) (RADC), Program Element #0305167G (NSA/Consolidated Computer Security Program (CCSP)), and

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D61 (Integrated Data System) - Continued
Program Element #0303126G (NSA). There is no duplication of effort.
- (U) Other Appropriation Funds: Operations and Maintenance: \$1638K (FY 1989); \$1600K (FY 1990) and \$1721K (FY 1991)
- (U) International Cooperative Agreements: Not Applicable.

(U) Project Number and Title: D62 (Protocol Development, Testing and Standardization) - This project provides for the specification development, implementation, and test and evaluation of proposed DoD standards for upper-level and networking protocols.

(U) FY 1989 Accomplishments:

- o Developed OSI management and security protocols.
- o Initiated implementation and testing of Government Open Systems Interconnection Profile (GOSIP) conformant protocols.
- o Implemented OSI routing and directory services protocols.
- o Developed specifications and implementations of advanced network protocols.
- o Developed and analyzed requirements for new network services.

(U) FY 1990 Planned Program:

- o Develop OSI management and security protocols.
- o Implement and test a set of GOSIP conformant protocols in a UNIX-Based Portable Operating System (POSIX) conformant Operating System.
- o Develop test procedures and test and evaluate dynamic adaptive routing protocols.

(U) FY 1991 Planned Program:

- o DT&E OSI management and routing protocols.
- o Develop test procedures and begin test and evaluation of multimedia mail system protocol.
- o Develop specifications and implementations for protocols for new network services.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: DCA, DCSO; SPARTA, McLean, VA; National Institute of Standards and Technology, Gaithersburg, MD.

(U) Related Activities: Work under this project complements the Internet Engineering work being done under the Integrated Data Systems (IDS) Project (D61). There is no duplication of effort between these projects.

(U) Other Appropriation Funds: None.

(U) International Cooperative Agreements: Not Applicable

(U) Project Number and Title: D63 (Defense Message System) - The purpose of the DMS RDT&E project is to provide systems engineering support to ensure that DMS requirements shall be satisfied. DMS is heavily oriented towards using Commercial Off-the-Shelf (COTS) technology and services, which are expected to satisfy many but not all of DMS's requirements. Secure

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

(U) D63 (Defense Message System) - Continued
messaging, transitional components, and systems engineering are major areas of the project focusing on military requirements. The DMS effort was originally part of the IDS project. FY91 is the first year that a distinct DMS project will be established. Prior years planned programs can be found in the IDS project D61.

(U) FY 1989 Accomplishments: See IDS project 61.

(U) FY 1990 Planned Program: See IDS project 61.

(U) FY 1991 Planned Program:

- o Revise COTS technology assessment/R&D planning baseline.
- o Develop DMS management system functional specification.
- o Develop DMS directory system preliminary functional specification.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: DCA, DCSO; MITRE Corporation, McLean, VA; Rome Air Development Center, USAF; Intermetrics, Cambridge, MA; SPARTA, McLean, VA; Arca Systems Inc., San Jose, CA; Naval Regional Data Automation Center (NARDAC), Washington, D.C.; Naval Research Laboratory, Washington, D.C.

(U) Related Activities: This project relates to P.E. 030126F (RADC), P.E. 030516G, (NSA/CCSP) and P.E. 0303126G (NSA). There is no duplication of effort between these projects.

(U) Other Appropriation Funds: None.

(U) International Cooperative Agreements: Not Applicable

(U) Project Number and Title: D75 (DCS Network Design and Performance Analysis) - This project supports the development of an integrated backbone and access area design software systems for an operational Defense Data Network (DDN) and Defense Switched Network (DSN).

(U) FY 1989 Accomplishments:

- o Performed Testing of network design features in the Design Algorithm (DESI).
- o Developed a prototype hardware/software system for DESI to do worldwide MILNET design.
- o Developed user-to-user network design algorithm.
- o Developed DCS network design algorithms prototype using T1 and T3 transmission facilities.

(U) FY 1990 Planned Program:

- o Develop an integrated access area/backbone design algorithms for end-to-end user design optimization.
- o Develop and prototype modern ADP system architecture (both hardware and software) for an operational DCS backbone and access area designs and performance analyses.

(U) FY 1991 Planned Program:

- o Enhance, update, maintain and modify computer aided network design and performance analyses software models.
- o Initiate efforts to develop network design algorithms for an integrated voice and data communications network.

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

- (U) D75 (DCS Network Design and Performance Analysis) - Continued
- (U) Program to completion: This is a continuing effort.
- (U) Work Performed By: DCA, DCSO; University of Virginia, Charlottesville, VA.
- (U) Related Activities: The Ada Trusted Software work relates to efforts being performed under Program Element #0305167G (NSA/Consolidated Computer Security Program (CCSP)). There is no duplication of effort.
- (U) Other Appropriation Funds: None.
- (U) International Cooperative Agreements: Not Applicable.

- (U) Project Number and Title: D76 (Communications Standards) - This project provides for the development of communications standards necessary to assure the interoperability and acceptable performance of DoD communications systems and foster interoperability with non-DoD systems.
- (U) FY 1989 Accomplishments:
 - o Completed the Government Open System Interconnection Profile (GOSIP) for the Integrated Service Digital Network (ISDN) protocols.
 - o Studied the impact on the DCS of an ISDN Global Numbering Plan.
 - o Completed the study of tactical and NATO applications of ISDN.
 - o Developed automated system for managing DoD participation in nongovernment standardization forums.
- (U) FY 1990 Planned Program:
 - o Evaluate Broadband ISDN (B-ISDN) for application in the DCS.
 - o Develop common long-haul/tactical digital switching standards.
- (U) FY 1991 Planned Program:
 - o Evaluate ISDN network management standards for application to the DCS.
 - o Revise DCS Digital System Standard to add rates above 64 kb/s.
- (U) Program to completion: This is a continuing program.
- (U) Work Performed By: DCA, DCSO; MITRE Corporation, McLean, VA.
- (U) Related Activities: ISDN efforts under this project complement work being done in the DSN Networking and System Engineering Project (D52). There is no duplication of effort between these projects.
- (U) Other Appropriation Funds: None.
- (U) International Cooperative Agreements: Not Applicable

- (U) Project Number and Title: S50 (DCS Architectural Standards Support)
 - Prior to FY 1991, architectural and standards support for DCS programs was funded within PE 0302019K. Effective in FY 1991, the DCS architectural and standards efforts have been consolidated with other DCS efforts in a single program element. This project provides for the development of near, mid, and long term DCS architectures; DCS systems analysis and integration;

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AMENDED FY 1991 RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303126K

Title: Long Haul Communications (DCS)

Budget Activity: 05

(U) S50 (DCS Architectural Standards Support) - Continued development of DSN testbed objectives; and cost/benefit analyses for DCS programs which support the National Military Command System (NMCS) and the World-Wide Military Command and Control System (WWMCCS).

(U) FY 1989 Accomplishments: See Project S10, PE 0302019K.

(U) FY 1990 Planned Program: See Project S10, PE 0302019K.

(U) FY 1991 Planned Program:

o Develop and review standards for the Defense Satellite Communications System (DSCS) follow-on.

o Develop a DCS wideband service architecture.

(U) Program to completion: This is a continuing program.

(U) Work Performed By: DCA, Center for Command and Control and Communications Systems (C4S); Contractors to be determined.

(U) Related Activities: There is no duplication of effort.

(U) Other Appropriation Funds: None.

(U) International Cooperative Agreements: Not Applicable

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AMENDED FY 1991 PRESIDENT'S BUDGET RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303127K

Budget Activity: 05

Title: National Communications System (NCS)

A. (U) RESOURCES (Dollars in \$000)

<u>Project Number & Title</u>	<u>FY 1989 Actual</u>	<u>FY 1990 Estimate</u>	<u>FY 1991 Estimate</u>	<u>To Complete</u>	<u>Total Program</u>
N03 Commercial SATCOM Interconnectivity	448	467	490	Continuing	Continuing
N11 NS/EP Telecommunications Interoperability and Standards	500	404	685	Continuing	Continuing
N19 EMP Mitigation	<u>3.505</u>	<u>2.892</u>	<u>2.251</u>	Continuing	Continuing
TOTAL	4,453	3,763	3,426		

B. (U) BRIEF DESCRIPTION OF ELEMENT: This program element supports Executive Order 12472 of 3 April 1984 which assigns the NCS the mission of assisting the President, the National Security Council, the Office of Science and Technology Policy, and the Office of Management and Budget, in exercising their wartime and non-wartime telecommunications functions and responsibilities, and the coordinating of the planning for and provision of national security and emergency preparedness telecommunications for the Federal government under all circumstances including crisis and emergency, attack, recovery, and reconstitution. To attain this objective, there are several National Security Decision Directives which provide additional guidance to the NCS which require that initiatives be developed that will improve the survivability and restorability of the commercial telecommunications systems that support national security requirements, enhance the survivability and endurability of U.S. commercial satellites, and provide communications support for Government agencies which have responsibilities for continuation of government functions during all phases of conflict.

C. (U) JUSTIFICATION FOR PROJECTS LESS THAN \$10.0 MILLION IN FY 1991:

(U) Project Number and Title: NO3 (Commercial SATCOM Interconnectivity (CSI)) - This project is required to develop emergency plans and procedures to coordinate the networking of selected commercial satellite facilities to support National Security Emergency Preparedness (NS/EP) telecommunications.

(U) FY 1989 Accomplishments:

- o Tested experimental equipment for performance characteristics.
- o Continued to update the CSI architecture.
- o Continued experimental test plans for mobile communications via satellite.

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AMENDED FY 1991 PRESIDENT'S BUDGET RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303127K

Budget Activity: 05

Title: National Communications System (NCS)

(U) Project Number and Title: NO3 (Commercial SATCOM Interconnectivity (CSI)) continued:

- (U) FY 1990 Planned Program:
 - o Validate experiments for Advanced Communications Technology Satellite (ACTS).
 - o Update Phase II CSI architecture.
 - o Continue mobile satellite simulation.
- (U) FY 1991 Planned Program:
 - o Modify ACTS terminals for transportability/mobility test.
 - o Update CSI architecture.
 - o Perform secure voice and mobile cellular demonstration for mobile satellite.
- (U) Program to Completion: This is a continuing program.
- (U) Work Performed By: Science Applications International Corporation, McLean VA; Jet Propulsion Lab, Pasadena, CA.
- (U) Related Activities: Not applicable.
- (U) Other Appropriation Funds: Operations and Maintenance: \$6,114K (FY 1989); \$4,340K (FY 1990); \$5,242K (FY 1991)
- (U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: N11 (National Security and Emergency Preparedness (NS/EP) Telecommunications Interoperability and Standards) - This project performs analysis of new telecommunications technologies in support of the Federal Telecommunications Standards Program and conducts related technical evaluations and standards development.

- (U) FY 1989 Accomplishments:
 - o Continued prior year program with increased emphasis on Integrated Services Digital Network (ISDN) interfaces and on network management systems.
 - o Started analyses of new switching technology, such as burst mode and packet voice, new transmission and multiplexing technologies, such as asynchronous time division and multiplexing.
- (U) FY 1990 Planned Program:
 - o Continue ISDN interfaces and network management.
 - o Continue analyses of switching and transmission technology.
 - o Develop methods to analyze emerging high speed multiplexing schemes for fiber optic systems.
 - o Develop analyses for the NS/EP impact of the new Telecommunication Management Networks.
- (U) FY 1991 Planned Program:
 - o Develop technical analyses relating to NS/EP requirements in new telecommunication technologies.
- (U) Program to Completion: This is a continuing program.

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AMENDED FY 1991 PRESIDENT'S BUDGET RDT&E DESCRIPTIVE SUMMARY

Program Element: 0303127K

Budget Activity: 05

Title: National Communications System (NCS)

(U) Project Number and Title: N11 (National Security and Emergency Preparedness (NS/EP) Telecommunications Interoperability and Standards) continued:

- (U) Work Performed By: National Telecommunications and Information Administration, Institute for Telecommunication Sciences, Boulder, CO.
- (U) Related Activities: Not applicable.
- (U) Other Appropriation Funds: Operations and Maintenance: \$1,999K (FY 1989); \$2,361K (FY 1990); \$1,961K (FY 1991)
- (U) International Cooperative Agreements: Not applicable.

(U) Project Number and Title: N19 (EMP Mitigation Program) - This project evaluates the vulnerability of National telecommunications to nuclear-generated Electromagnetic Pulses (EMP), electromagnetic interference including lightning, and radiation through equipment testing and assessment.

- (U) FY 1989 Accomplishments:
 - o Continued EMP testing of AT&T #4 ESS switch.
 - o Initiated radiation hardness assessment of the AT&T #4 ESS switch.
- (U) FY 1990 Planned Program:
 - o EMP testing of the Northern Telecom FD 565 fiber optic repeater and terminal.
 - o Finish EMP testing of AT&T #4 ESS switch.
 - o Complete fallout radiation response model for fiber optic cables.
- (U) FY 1991 Planned Program:
 - o Initiate EMP vulnerability testing and analyses of digital access cross connect switches.
 - o EMP testing of series G AT&T fiber optic terminal and repeater.
- (U) Program to Completion: This is a continuing program.
- (U) Work Performed By: AT&T Technologies, Holmdel, NJ; Naval Research Laboratory, Washington, D.C.; Harry Diamond Laboratories, Woodbridge, VA.
- (U) Related Activities: Not applicable.
- (U) Other Appropriation Funds: Operation and Maintenance: \$1,290K (FY 1989); \$1,389K (FY 1990); \$1,708K (FY 1991)
- (U) International Cooperative Agreements: Not applicable.

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